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RESEARCH ARTICLE

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# Notulae to the Italian flora of algae, bryophytes, fungi and lichens: 11

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## Abstract

In this contribution, new data concerning bryophytes, fungi, and lichens of the Italian flora are presented. It includes new records and confirmations for the bryophyte genera *Aneura*, *Aulacomnium*, *Dumortiera*, *Fossombronia*, *Hennediella*, *Hygrohypnella*, *Pohlia*, *Porella*, *Riccardia*, *Tortella*, and *Tortula*, the fungal genera *Cortinarius*, *Mycena*, *Naucoria*, *Trichoglossum*, and *Tubaria* and the lichen genera *Agonimia*, *Blastenia*, *Chaenotheca*, *Cladonia*, *Endocarpon*, *Gyalecta*, *Lecanographa*, *Parmeliella*, *Porpidia*, *Stenhammarella*, and *Thelidium*.

**Keywords**

Ascomycota, Basidiomycota, Bryidae, Jungermanniopsida, Marchantiidae

## How to contribute

The text of the records should be submitted electronically to: Cecilia Totti (c.totti@univpm.it) for algae, Marta Puglisi (mpuglisi@unict.it) for bryophytes, Alfredo Vizzini (alfredo.vizzini@unito.it) for fungi, Sonia Ravera (sonia.ravera@unipa.it) for lichens. Each text should be within 1,000 characters (spaces included).

## Floristic records

### Bryophytes

***Aneura pinguis* (L.) Dumort. (Aneuraceae)**

\+ **CAM**: Savone delle Ferriere, Teano (Caserta), on tuffs (UTM WGS84 33T 420170.4568975), 220 m, 4 August 2019, leg. *A. Croce*, det. *V. Plášek* (Herbarium A. Croce). – Species new for the flora of Campania.

*Aneura pinguis* is a cosmopolitan species, ranging from Europe, Asia, Australia, and New Zealand to North America and Mexico (Paton 1999). It represents a complex of cryptic species (Myszczyński et al. 2017). *Aneura pinguis* produces flat, green to dark green creeping thalli, which grow single or usually together with other bryophytes in moist habitats. It is common from lowlands up to the high mountain zone and grows on various habitats, such as on damp and wet peaty soil, flushed rocks, banks, lake and steam margins, base-rich fens. According to Aleffi et al. (2020) this frondose liverwort is distributed in all the Italian regions with the exception of Puglia and Campania.

A. Croce, V. Plášek, M. Aleffi

***Aulacomnium androgynum* (Hedw.) Schwägr. (Aulacomniaceae)**

+ **TAA**: Cascata del Lupo, Bedollo (Trento), on a rotting wood (UTM WGS84: 32T 676998.5114915), 906 m, 20 October 2020, leg. *G. Bergamo Decarli,* det. *F. Sguazzin* (Bryophytorum Herbarium F. Sguazzin); near the Redebus bog, Bedollo (Trento), along the bank of the Regnana stream, on a rotting wood (UTM WGS84: 32T 677074.5115017), 1428 m, 17 April 2018, leg. *G. Bergamo Decarli, det. F. Sguazzin* (Bryophytorum Herbarium F. Sguazzin); not far from the Combricol "Malga", Bedollo (Trento), under a dripping rock on a rotting wood (UTM WGS84: 32T 678705.5111581), 1630 m, 29 May 2015, leg. *G. Bergamo Decarli*, det. *F. Sguazzin* (Bryophytorum Herbarium F. Sguazzin). – Species new for the flora of Trentino-Alto Adige.

*Aulacomnium androgynum* is a temperate species widespread in northern Europe, up to 63° N, in Cyprus, Turkey, North Africa, Central Asia, Japan, Korea, Canary Islands, North America, and Patagonia (Smith 2004). In northern Italy the species was recently reported for Val d'Aosta, Piemonte, and Lombardia (Aleffi et al. 2020). According to Dierßen (2001), *A. androgynum* is a highly acidophytic to subneutrophytic species, moderately hygrophytic to mesophytic, considerably sciophytic, and saprolignic, usually occurring on decaying organic matter.

F. Sguazzin, G. Bergamo Decarli

***Dumortiera hirsuta* (Sw.) Nees subsp. *hirsuta* (Dumortieraceae)**

+ **CAM**: Savone delle Ferriere, Teano (Caserta), on acid rocks and humus at the bottom of the shady gorge, in a site rich in ferns dominated by *Woodwardia radicans* (L.) Sm. (UTM WGS84 33T 420670.4568811), 180 m, 21 August 2019, leg. *A. Croce*, det. *V. Plášek* (Herbarium A. Croce). – Subpecies new for the flora of Campania.

*Dumortiera hirsuta* (Sw.) Nees subsp. *hirsuta* is an euoceanic- w. mediterranean-macaronesian species, widely distributed in tropical regions. This frondose liverwort is listed as Endangered by Rossi et al. (2013) and Near Threatened (NT) by Hodgetts et al. (2019). In Italy, it was recorded only for Friuli Venezia Giulia (doubtfully), Liguria, Toscana, and Calabria (Aleffi et al. 2020). Robust forms of *Pellia* are sometimes mistaken for *Dumortiera*, but the latter is clearly distinguished by typical male and female receptacles with conspicuous marginal hairs.

A. Croce, V. Plášek, M. Aleffi

***Fossombronia caespitiformis* De Not. ex Rabenh. subsp. *multispira* (Schiffn.) J.R.Bray & Cargill (Fossombroniaceae)**

+ **PUG**: Lama di Lupo, Sant'Eramo in Colle (Bari), on thin soil (UTM WGS84: 33T 644122.4514233), 460 m, 9 March 2019, leg. *V. Tomaselli*, det. M. *Puglisi* (CAT). – Subpecies new for the flora of Puglia.

*Fossombronia caespitiformis* subsp. *multispira* is a Mediterranean-Atlantic taxon, usually growing on thin soil over rocky cliffs and along the side of paths, in microsites which are moist in winter but dry in summer. The diagnostic character of this subspecies is that the elaters are consistently 3–5- spiralled, whereas in *F. caespitiformis* subsp. *caespitiformis* they are regularly bispiralled (Sotiaux et al. 2009). This subspecies is widespread in Italy (Aleffi et al. 2020). In the new site, *F. caespitiformis* subsp. *multispira* was found within the Natura 2000 site "Murgia Alta" (SCI IT9120007). Here, it grew in disturbed habitats, generally in transition between pastures and grasslands, on thin soil accumulated in small corrosion pools.

M. Puglisi, V. Tomaselli

***Hennediella heimii* (Hedw.) R.H.Zander (Pottiaceae)**

+ **ITALIA** (**TAA**): Fassa Valley, Catinaccio Group, Pale Rabbiose above Vigo di Fassa, sheltered base of south facing dolomitic rock with *Hornungia pauciflora* (Koch) Soldano & al. (UTM WGS84: 32T 702944.5145248), 2312 m, 28 June 2020, *F. Prosser* (Herb. Prosser No. 05072). – Species confirmed for the flora of Italy (Trentino-Alto Adige).

This species is reported for Italy by Aleffi et al. (2020) as not confirmed after 1968 in Piemonte, Lombardia, Trentino-Alto Adige, Lazio, and Campania. In particular, for Trentino-Alto Adige there are two old records for Sexten (Dalla Torre and Sarnthein 1914) and for Ratzes (Milde 1864). *Hennediella heimii* is a species occurring in Europe in saline habitats mainly along coasts (Frey et al. 2006), but it is reported in Switzerland up to 2,400 m elevation (Swissbryophytes 2004–2020). The sheltered habitat, where *H. heimii* was found at Pale Rabbiose, offers refuge to chamois that, with their urine, probably create the saline conditions necessary for this moss.

F. Prosser

***Hygrohypnella ochracea* (Turner ex Wilson) Ignatov & Ignatova (Campyliaceae)**

+ **LIG**: "IT1331721 Val Noci - Torrente Geirato - Alpesisa", Rio Val Noci, Montoggio (Genova), rock in torrent (UTM WGS84: 32 T 502634.4918701), 500 m, 6 August 2020, *I. Briozzo, D. Dagnino, C. Turcato* (GE B236). – Species new for the flora of Liguria.

*Hygrohypnella ochracea* occurs in several countries of the Mediterranean basin (Ros et al. 2013) and in a few administrative regions of northern Italy (Aleffi et al. 2020). In the new site, *H. ochracea* was found on rocks in flowing water with typical herbaceous vegetation (*Agrostis stolonifera* L., *Typha latifolia* L., *Veronica beccabunga* L., *Juncus articulatus* L.,

*Juncus inflexus* L.). In the same site other moss species were found, such as *Rhynchostegium riparioides* (Hedw.) Cardot and *Eurhynchium striatum* (Hedw.) Schimp.

I. Briozzo, D. Dagnino, C. Turcato

***Pohlia bulbifera* (Warnst.) Warnst. (Mniaceae)**

+ **SAR**: Isola Serpentara, Villasimius (Sud Sardegna), on soil (UTM WGS84: 32S 552371.4332380), ca. 20 m, 9 February 2001, *S. Poponessi, A. Cogoni* (CAG No. SA2.6.2.1.). – Species new for the flora of Sardegna.

*Pohlia bulbifera* is a circumpolar boreo-temperate species, widespread in Europe and in the whole Boreal hemisphere, but rare in the Mediterranean area (Ros et al. 2013). According to Aleffi et al. (2020), the presence in Italy of *P. bulbifera* is currently restricted to Piemonte and Marche, while in Lombardia and Sardegna it has not been confirmed over the last 50 years. In particular, it was reported in Sardegna, without specifying the altitude, only for Gennargentu (Herzog 1926). This species is characterized by axillary gemmae with four or five laminate leaf primordia which are concave and form a dome over the gemma apex.

S. Poponessi, A. De Agostini, A. Cogoni

***Porella arboris-vitae* (With.) Grolle subsp. *arboris-vitae* (Porellaceae)**

+ **LIG**: Ponte dei Passi, Rezzo (Imperia), Tilio-Acerion mixed forest in a creek ravine (UTM WGS84: 32T 406909.4874820), 770 m, 10 June 2020, *D. Dagnino, M. Mariotti* (GE B251). – Species confirmed for the flora of Liguria.

*Porella arboris* subsp. *arboris-vitae* was no longer recorded for Liguria (before 1968), despite it's presence in most of the surrounding Italian regions (Aleffi et al. 2020). We found this species within a Tilio-Acerion mixed forest referring to the Directive 92/43/CEE Habitat of priority interest code 9180*. The site of discovery is close to the border of the SAC "IT1314609 M. Monega – M. Prearba", thus the species probably also occurs within the protected area. It is a basiphytic, sciophytic, meso-xerophytic, saxicolous and occasionally epiphytic taxon normally found on shaded basic rocks in woods (Dierßen 2001). *Porella arboris-vitae* subsp. *arboris-vitae* is a Mediterranean-Atlantic species, considered as NT in the new European Red List of bryophytes (Hodgetts et al. 2019).

D. Dagnino, M. Mariotti

***Riccardia palmata* (Hedw.) Carruth. (Aneuraceae)**

+ **CAL**: Vallone delle Sette Acque, Sila Grande (Cosenza), on rotting logs (UTM WGS 84: 33S 624656.4354888), 1322 m, 20 August 2020, *D. Puntillo, M. Puntillo* (CLU No. 4190); Vallone Fossiata, Sila Grande (Cosenza), on rotting logs (UTM WGS 84: 33S 636772.4363141), 1336 m, 25 August 2020, *D. Puntillo, M. Puntillo* (CLU No. 4191). – Species new for the flora of Calabria.

*Riccardia palmata* is recognizable in the field for its dark, erect green palmately branched thallus. This is the only species of *Riccardia* that usually grows on rotting wood. In the collection sites, *R. palmata* forms dense green patches of flat fronds and grows in the most humid and shady part of the forest, especially along the stream, on decaying wood, together with *Nowellia curvifolia* (Dicks.) Mitt., *Lophocolea heterophylla* (Schrad.) Dumort. subsp. *heterophylla*, and *Buxbaumia viridis* (Moug. ex Lam. & DC.) Brid. ex Moug. & Nestl. This species in Italy is known from the Alps to Toscana with an outpost in Sicilia (Aleffi et al. 2020).

D. Puntillo, M. Puntillo

### *Tortella flavovirens* (Bruch) Broth. var. *flavovirens* (Pottiaceae)

+ **LIG**: Final section of the trail to Punta Manara, Sestri Levante (Genova), on sandstone in xerothermophilous pioneer herbaceous vegetation (UTM WGS84: 32T 532293.4900019), 50 m, 24 May 2020, *C. Turcato, D. Dagnino* (GE B235). – Variety confirmed for the flora of Liguria.

*Tortella flavovirens* var. *flavovirens* occurs in most of the Italian administrative regions (Aleffi et al. 2020) and in several Mediterranean countries (Ros et al. 2013), growing in rock crevices or sand dunes in the basal zone, mainly along the coast (Cortini Pedrotti 2001). An old record of this species is available for Rapallo (Genova) (Fleischer 1893), but it was no longer recorded for Liguria (Aleffi et al. 2020). In the new site, this species was found within a mosaic of garigues and therophytic grasslands above the rocky coast of the Promontory of Punta Manara, on sandy soil subjected to marine aerosols. *Tortella flavovirens* var. *flavovirens* is an heliophlous, halotolerant, xero-thermophytic plant (Dierßen 2001), occurring in several coastal Mediterranean habitats (Aleffi et al. 2005; Esposito and Filesi 2007; Privitera et al. 2008; Puglisi et al. 2019).

D. Dagnino, C. Turcato, G. Berta

### *Tortella inclinata* (R.Hedw.) Limpr. (Pottiaceae)

+ **MOL**: Campomarino (Campobasso), retrodunal garrigue of Cisto-Lavanduletalia (UTM WGS84: 33T 510306.4641807), 4 m, 5 November 2020, *M. Tiburtini* (PI040612). – Species new for the flora of Molise.

*Tortella inclinata* is a temperate species, that thrives in harsh conditions. It is a tuft-forming moss, that grows often in basiphytic and xerophytic conditions. It can be found either in foredune and retrodunal environments (Murru et al. 2018). Indeed, I found this species growing on sand in a garigue of the habitat 2260 "Cisto-Lavanduletalia dune sclerophyllous scrubs". The combination of foliar characters, i.e., absence of papillae on the costa, ascending hyaline cells, acute and cucullate apex, make it easily distinguishable from related species, such as *T. densa* (Lorentz & Molendo) Crundw. & Nyholm, *T. flavovirens* (Bruch) Broth. var. *flavovirens*, and *Trichostomum brachydontium* Bruch.

M. Tiburtini

***Tortula caucasica* Broth. (Pottiaceae)**

+ **LIG**: Monte Croce dei Tozzi, Casarza Ligure (Genova), on serpentine in arborescent matorral with *Juniperus* sp. pl. (UTM WGS84: 32T 537512.4901829), 130 m, 24 May 2020, *C. Turcato, D. Dagnino* (GE B233); final section of the trail to Punta Manara, Sestri Levante (Genova), on sandstone in xero-thermophilous pioneer herbaceous vegetation (UTM WGS84: 32T 532293.4900019), 50 m, 24 May 2020, *C. Turcato, D. Dagnino* (GE B234). – Species confirmed for the flora of Liguria.

*Tortula caucasica* occurs in most of the Italian administrative regions (Aleffi et al. 2020) and it is found in many Mediterranean countries (Ros et al. 2013), growing in exposed and disturbed environments, in the basal zone (Cortini Pedrotti 2001; Dierßen 2001). A record of this species in Liguria was made by Piccone (1863) but it is no longer recorded for Liguria (Aleffi et al. 2020). This species can be distinguished from other closely related taxa for the rudimental peristome, the upper leaf cells smooth or weakly papillose, and the recurved leafy margins (Ros and Werner 2007). We found this species in xero-thermic Mediterranean environments, dominated by discontinuous shrubby and herbaceous vegetation, referring to several Directive 92/43/CEE Habitats (cod. 6220* and 5210).

D. Dagnino, C. Turcato, G. Berta

## Fungi

***Cortinarius ochraceopallescens* Moënne-Locc. & Reumaux (Cortinariaceae)**

+ **LIG**: Palo, Sassello (Savona) under *Fagus sylvatica* L. (UTM WGS84: 32T 464099.4925732), 660 m, 22 October 2016, *F. Boccardo* (Herb. GDOR 3948); Dolcina, Rapallo (Genova) under *Quercus pubescens* Willd. (UTM WGS84: 32T 514013.4909289), 377 m, 19 November 2011, *M. Clericuzio, F. Boccardo* (Herb. GDOR 2435). – Species new for the flora of Liguria.

*Cortinarius ochraceopallescens* belongs to *Cortinarius* sect. *Calochroi* M.M.Moser & Horak, and it is characterized by a relatively large size, pale ochraceous-yellowish colours on pileus, often with velar patches, tending to stain in age owing to scattered brownish spots; tender violet lamellae, negative reactions on pileus and bulbipellis with KOH, spores (9.5)10–12.5(14) × 6–7(7.5) µm, amygdaliform, strongly verrucose (Bidaud et al. 2001).

F. Boccardo, M. Clericuzio, F. Dovana

***Mycena stylobates* (Pers.) P.Kumm. (Mycenaceae)**

+ **CAL**: Botanical Garden of the University of Calabria, Rende (Cosenza), on leaf litter under the crown of a holm oak tree (*Quercus ilex* L.) (UTM WGS84: 33S 605942.4357155), 216 m, 13 November 2020, *A.B. De Giuseppe, N.G. Passalacqua, G. Sicoli* (CLU No. F312). – Species new for the flora of Calabria.

*Mycena stylobates* is an agaricoid fungus colonising the leaf litter of deciduous trees from where its stipitate and bright-white small pileate basidiomata emerge, easily recognisable for a distinct basal disc at the point of attachment of the stipe to the leaf. A dozen of such basidiomata were detected showing glabrous and at most 10 mm diameter max sized pilei, 5 mm long and 1 mm thick stipes, and maximum 2.5 mm max wide basal discs surrounded by a hairy edge easily detectable under a lens (Elborne et al. 1992, Walther et al. 2001). Although occurring in almost all administrative regions in central and northern Italy, *M. stylobates* has not, so far, apparently been reported from southern Italy, except from Puglia (Onofri et al. 2013).

A.B. De Giuseppe, N.G. Passalacqua, G. Sicoli

### *Naucoria bohemica* Velen. (Hymenogastraceae)

+ **CAL**: Botanical Garden of the University of Calabria, Rende (Cosenza), on the ground in a deciduous coppice stand (*Quercus* spp. as prevailing tree species) (UTM WGS84: 33S 605950.4357342), 200 m, 23 October 2020, *G. Sicoli, A.B. De Giuseppe, N.G. Passalacqua* (CLU No. F310). – Species new for the flora of Calabria.

A group of small agaricaceous basidiomata belonging to *Naucoria bohemica* was detected on the ground along a path surrounded by *Quercus cerris* L. and *Q. pubescens* Willd. in a mixed broadleaved coppice stand where this fungus is an ectomycorrhizal agent to tree species. The chestnut-brown and 2–3 mm diameter campanulate pilei of basidiomata were easily recognisable for being radially weakly striate close to the edge. The stipe showed a dense silvery white coating disappearing at maturity and by handling. The ochre, verrucose and amygdaliform spores exceeding 10 µm in length were produced mostly at the top of 2-spored basidia, and cheilocystidia were apically obtuse and subcylindric (Døssing 1992; Courtecuisse and Duhem 1995; Moreau and Borovička 2010). This species was already reported in northern and central Italy (Onofri et al. 2013).

G. Sicoli, A.B. De Giuseppe, N.G. Passalacqua

### *Trichoglossum tetrasporum* Sinden & Fitzp. (Geoglossaceae)

+ **CAL**: Botanical Garden of the University of Calabria, Rende (Cosenza), on the ground among mosses in a deciduous coppice oak stand (UTM WGS84: 33S 605941.4357277), 205 m, 13 January 2021, *G. Sicoli, S. Rovito, D. Puntillo* (CLU No. F313). – Species new for the flora of Calabria.

*Trichoglossum tetrasporum* is an ascomycete living on the ground in meadows, forests and bogs, and producing a 10-mm high blackish club-shaped hymenophore borne by a non well defined, same height, longer or shorter, narrow stipe. The hymenial and stem surfaces are covered with fine erect setae as in *Trichoglossum hirsutum* (Pers.) Boud.; *T. tetrasporum* differs from this species by forming 105–140 µm long and 15-septate (when mature) ascospores in four-spored asci instead of eight-spored ones (Courtecuisse and Duhem 1995; Ohenoja 2000). In Italy *T. tetrasporum* has so far been detected only in Sicily (Lantieri 2011).

G. Sicoli, S. Rovito, D. Puntillo

### *Tubaria furfuracea* (Pers.) Gillet (Tubariaceae)

+ **CAL**: Botanical Garden of the University of Calabria, Rende (Cosenza), on the ground at the edge of a riparian wood (*Populus* ×*canescens* and *Salix* sp. pl. as prevailing species) (UTM WGS84: 33S 605955.4357351), 200 m, 23 October 2020, *N.G. Passalacqua, A.B. De Giuseppe, G. Sicoli* (CLU No. F311). – Species new for the flora of Calabria.

Small agaricaceous basidiomata belonging to *Tubaria fufuracea* were observed and identified on the ground close to *Populus* and *Salix* trees, where this fungus is a plant-remnants degrading agent. The reddish-brown and 2-3 mm-diameter basidiomata were easily recognisable due to the typical small, white veil remnants close to the edge of the campanulate, hygrophanous and striate pilei. The smooth and ellipsoid spores were light ochre and cheilocystidia were typically subcapitate (Jacobsson 1992; Courtecuisse and Duhem 1995; Matheny et al. 2007).

N.G. Passalacqua, A.B. De Giuseppe, G. Sicoli

## Lichens

### *Agonimia globulifera* M.Brand & Diederich (Verrucariaceae)

+ **PIE**: Vernante (Cuneo), 3 km NNW of Limone Piemonte (Cuneo), growing on soil on a limestone outcrop in deciduous forest (UTM WGS84: 32T 384862.4898399), 920 m, 27 April 2012, *J. Malíček* (Herb. Malíček no. 7068). – Species new for the flora of Piemonte.

*Agonimia globulifera* is a crustose lichen, well characterized by the presence of black, glossy sterile globules (aggregated goniocysts) on a minutely granulose greenish thallus. In Europe, this species generally occurs on moss, plant debris, humus, and rarely on rocks in open calcareous areas at mainly low and middle elevations (Olsen et al. 2019, Malíček et al 2020); nonetheless, its overall distribution is poorly known. This is the third report for the flora of Italy (Nimis 2016) concerning this species, which is scatteredly reported in the Alps (Nimis et al. 2018).

J. Malíček, S. Ravera

### *Blastenia monticola* Arup & Vondrák (Teloschistaceae)

+ **LOM**: Boschi del Giovetto di Palìne Natural Reserve, Roccolo del Gatì, Borno (Brescia), on bark of *Picea abies* (L.) H.Karst. (UTM WGS84: 32T 587850.5090486), 1710 m, 25 October 2020, leg. *G. Gheza*, det. *G. Gheza, P.L. Nimis* (Herb. Nascimbene JN7012, Herb. Gheza). – Species new for the flora of Lombardia.

+ **VEN**: Dolomiti d'Ampezzo Natural Park, Socroda, Cortina d'Ampezzo (Belluno), on bark of *Rhododendron ferrugineum* L. (UTM WGS84: 33T 277742.5169622), 2150 m, 17 June 1998, leg. *J. Nascimbene*, det. *J. Nascimbene, P.L. Nimis* (Herb. Nascimbene JN265). – Species new for the flora of Veneto.

+ **TAA**: Zirmboden, Obereggen (Bolzano), on bark of *Picea abies* (L.) H.Karst. (UTM WGS84: 32T 695717.5139877), 1950 m, 11 May 2012, leg. *J. Nascimbene*,

det. *J. Nascimbene, P.L. Nimis* (Herb. Nascimbene JN2694). – Species new for the flora of Trentino-Alto Adige.

This is a recently-described species (Vondrák et al. 2020) of subalpine environments, colonizing acid bark of conifers or twigs of shrubs. Most earlier records of *Blastenia herbidella* (Hue) Servít from the Alps may refer to this species. This is the case for the two records reported here, both collected in subalpine environments, that were previously published under that name (Nascimbene and Caniglia 2003; Nascimbene 2013). The distinction between the two species on a morphological basis is not easy, being mainly based on the shape of blastidia. However, the two species seem to be well differentiated ecologically (Vondrák et al. 2020).

J. Nascimbene, G. Gheza, P.L. Nimis

***Chaenotheca brachypoda* (Ach.) Tibell (Coniocybaceae)**

+ **VEN**: Casera Razzo,Vigo di Cadore (Belluno), on wood of *Abies alba* Mill. (UTM WGS84: 33T 316446-5150323), ca. 1700 m, 12 September 1987, *D. Puntillo* (CLU No. 4223). – Species new for the flora of Veneto.

During a review of some specimens of Caliciod lichens stored in the CLU herbarium, several apothecia of *Chaenotheca brachypoda* were found mixed together with *Chaenotheca trichialis* (Ach.) Hellb. and its parasite *Microcalicium disseminatum* (Ach.) Vainio. *Chaenotheca brachypoda* has an endosubstratic thallus, and it is recognizable for its densely yellowish green-pruinose stalk, the spherical capitulum with yellow-green pruina with poorly developed excipulum and the evanescent cylindrical asci characteristically formed in chains. This specimen was collected on lignum of *Abies alba* Mill., on the face protected from rain. It is a rare species, classified in the Italian Red List of epiphytic lichens as "Endangered" (Nascimbene et al. 2013).

D. Puntillo

***Cladonia subturgida* Samp. (Cladoniaceae)**

+ **TOS**: Montecristo, Portoferraio (Livorno), on soil in the shrubland along the trail to Monte della Fortezza (UTM WGS84: 32T 607034.4688072), 195 m, 10 May 2016, leg. *E. Bianchi, R. Benesperi, L. Di Nuzzo*, det. *T. Athi* (Herb. Benesperi RB14). – Species new for the flora of Toscana.

*Cladonia subturgida* is a fruticose lichen with composite thallus. The primary thallus is persistent while the secondary thallus, which bears dark brown apothecia, is often absent. Despite being previously reported only for the Iberian Peninsula and Canary Islands (Pino-Bodas et al. 2012), a recent study showed that it is quite common in the Mediterranean region and that it was probably often misidentified with other *Cladonia* species (Pino-Bodas et al. 2020). It can be distinguished from similar species by the absence of scyphi and the presence of large pycnidia on the squamules, which are fragile with a pale-green upper side and a grey-brownish lower side (Burgaz et al. 2020). This species was previously reported for Italy only for Calabria and Sardegna (Pino-Bodas et al. 2020; Burgaz et al. 2020).

E. Bianchi E., R. Benesperi R., L. Di Nuzzo

***Endocarpon psorodeum* (Nyl.) Blomb. & Forssell (Verrucariaceae)**

+ **LOM**: Dossi di Santicolo, Corteno Golgi (Brescia), along the road between Edolo and Santicolo, on a schist outcrop (Scisti di Edolo formation) (UTM WGS84: 32T 599618.5113738), 807 m, 19 August 2019, leg. *G. Gheza*, det. *L. Di Nuzzo* (Herb. Gheza); trail between Saviore dell'Adamello and Fabrezza (Brescia), on a schist outcrop (Scisti di Edolo formation) (UTM WGS84: 32T 608473.5104057), 1272 m, 3 January 2020, *G. Gheza* (Herb. Gheza). – Species new for the flora of Lombardia.

*Endocarpon psorodeum* is a squamulose chlorolichen with distinctly flattened and ascending squamules and black globose perithecia with hymenial algae (Nimis 2020). It is similar to *Endocarpon adscendens* (Anzi) Müll. Arg., whose squamules have dark rhizohyphae, lacking in *E. psorodeum*. Another similar species is *Endocarpon latzelianum* Servít, which grows on calcareous substrates, whereas *E. psorodeum* grows on basic siliceous substrates (Nimis and Nascimbene 2021). This species has been scatteredly reported in the Alps (Nimis et al. 2018) and only in Piemonte in Italy (Nimis 2016).

G. Gheza, C. Vallese, L. Di Nuzzo

***Gyalecta derivata* (Nyl.) H. Olivier (Gyalectaceae)**

+ **CAM**: Santuario S.S. Annunziata, Licusati frazione di Camerota (Salerno), on *Olea europaea* L. (UTM WGS84: 33T 530453.4434790), 410 m, 4 April 2010, *S. Ravera* (Herb. Ravera); Omignano (Salerno), on *Castanea sativa* Mill. (UTM WGS 84: 33T 506305.4454875), 750 m, 14 July 2010, *S. Ravera* (Herb. Ravera); Centola (Salerno), on *Olea europaea* L. (UTM WGS 84: 33T 527122.4436156), 340 m, 25 February 2011, leg. *G. Brunialti, V. Genovesi, S. Ravera*, det. *S. Ravera* (Herb. Ravera). – Species new for the flora of Campania.

*Gyalecta derivata* is a crustose trentepohlioid lichen with a thin or inconspicuous grey thallus and urceolate apothecia, characterized by orange-brown disc. It can be easily differentiated from other species of the genus by oblong-fusiform ascospores (5–)7–13–septate, rarely with 1–2 longitudinal septa. This species is widespread in Europe and also known from North Africa (Werner 1972), and in Italy it is usually found in natural or semi-natural habitats with a humid-warm climate on bark on broad-leaved trees (Nimis 2016). *Gyalecta derivata* is included in the Italian Red List of epiphytic lichens, under the "Near-threatened" category (Nascimbene et al. 2013).

S. Ravera

***Lecanographa amylacea* (Ehrh. ex Pers.) Egea & Torrente (Lecanographaceae)**

+ **CAM**: S. Severino di Centola (Salerno), on wood (UTM WGS84: 33T 529671.4437415), 130 m, 21 February leg. *G. Brunialti, V. Genovesi, S. Ravera*, det. *S. Ravera*; Pisciotta (Salerno), on *Olea europaea* L. (UTM WGS84: 33T 519127.4440793), 230 m, 22 February 2011, leg. *G. Brunialti, V. Genovesi, S. Ravera*, det. *S. Ravera* (Herb. Ravera). – Species new for the flora of Campania.

*Lecanographa amylacea* is a crustose trentepohlioid lichen with a thick, chalky white to grey-white, farinose thallus and densely white-pruinose, round to irregular black apothecia, more or less immersed in the thallus. It is a mild-temperate, mainly western lichen, rare in Italy (Nimis 2006), usually found on dry bark of old trees not directely wetted by rain, in ancient woodlands or also historical urban parkland e.g. Botanical Garden in Rome (Ravera et al. 1999; Munzi et al 2007), Garden of Ninfa, in the territory of Cisterna di Latina (Herb. Ravera 3126). The specimen recorded in Pisciotta were collected on centenary trees in olive groves.

S. Ravera

***Parmeliella testacea* P.M.Jørg. (Pannariaceae)**

+ **ABR**: Vallone Grascito, south of Sulmona (L'Aquila), on the bark of *Quercus pubescens* Willd. (UTM WGS84: 33T 413890.4652618), 545 m, 7 July 2020, leg. *L. Paoli, Z. Fačkovcová, S. Loppi, A. Vannini*, det. *L. Paoli, Z. Fačkovcová, S. Loppi*. – Species new for the flora of Abruzzo.

This cyanolichen has a squamulose thallus, typically characterized by chestnut brown to grey-brown rosettes, loosely attached (Nimis 2016). The squamules are generally 2-3 mm wide: when the thallus is developed, the marginal ones are elongate and radiating. Soralia are mainly marginal and resembling isidia, breaking down into blue-grey, granular soredia. In the study site, few small thalli without apothecia have been observed, growing together with *Bacidia fraxinea* Lönnr., *Catillaria nigroclavata* (Nyl.) J.Steiner, *Collema subflaccidum* Degel. *Parmeliella testacea* is included in the Italian Red List of epiphytic lichens under the category "Least Concern" (Nascimbene et al. 2013).

L. Paoli, Z. Fačkovcová, S. Loppi

***Porpidia flavicunda* (Ach.) Gowan (Lecideaceae)**

+ **TAA**: Val Comasine, Pejo (Trento), on siliceous rocks (UTM WGS84: 32T 628432.5132684), 2070 m, 31 August 2020, leg. *T.L. Bacchilega*, det. *J. Nascimbene* (Herb. Nascimbene JN7050). – Species confirmed for the flora of Trentino-Alto Adige.

*Porpidia flavicunda* is a variable species (see Nimis 2016) with a circumpolar, artic-alpine distribution, that was previously collected in Trentino-Alto Adige in the late 19th Century (see references in Nimis 1993). The record reported here was collected on a siliceous boulder in a very humid situation, in an open *Larix*-forest that is one of the lichen-richest habitats in the Alps (Nascimbene et al. 2006, 2012).

J. Nascimbene

***Stenhammarella turgida* (Ach.) Hertel (Lecideaceae)**

+ **VEN**: Dolomiti Bellunesi National Park, Vette Feltrine, Col dei Cavai, Sovramonte (Belluno), on selciferous calcareous rocks (UTM WGS84: 32T 719874.5106811), 1660 m, 28 June 2020, leg. *J. Nascimbene*, det. *P.L. Nimis* (Herb. Nascimbene JN7120);

Dolomiti Bellunesi National Park, Cimonega, Col dei Bechi, Cesiomaggiore (Belluno), on selciferous calcareous rocks (UTM WGS84: 32T 727065.5115734), 1975 m, 12 August 2020, leg. *J. Nascimbene*, det. *P.L. Nimis* (Herb. Nascimbene JN7121). – Species confirmed for the flora of Veneto.

This species, widespread throughout the Alps (Nimis et al. 2018), is typical of rocks containing a low percentage of calcium carbonate, mostly on steeply inclined, north-exposed and rather humid faces near or above treeline, as in the case of the records reported here, that were collected on flint layers included in a carbonatic, late Jurassic formation. The last, and only, record from Veneto dates back to the mid-19th century (Nimis 1993) and in the original source (Massalongo 1852) there is no detailed reference to collection locality.

J. Nascimbene, P.L. Nimis

***Thelidium auruntii* (A. Massal.) Kremp. (Verrucariaceae)**

+ **VEN**: Dolomiti d'Ampezzo Natural Park, Tofana di Rozes, Cortina d'Ampezzo (Belluno), on dolomite (UTM WGS84: 33T 273856.5158438), 2870 m, 5 August 2020, leg. *J. Nascimbene*, det. *P.L. Nimis, J. Nascimbene* (Herb. Nascimbene JN6884). – Species confirmed for the flora of Veneto.

*Thelidium auruntii* differs from the related *Thelidium pyrenophorum* (Ach.) Körb. in the well-developed, brown thallus and the smaller spores. Known form several scattered stations throughout the Alps (Nimis & al. 2018), it is also known from Scandinavia and grows on limestone, dolomite and calciferous schists in upland areas. The material reported here was collected on a humid dolomitic wall along the path to the top of Tofana di Rozes. The last records from Veneto date back to the 19th century (see Nimis 1993).

J. Nascimbene, P.L. Nimis

***Thelidium ungeri* Körb. (Verrucariaceae)**

+ **VEN**: Dolomiti d'Ampezzo Natural Park, Tofana di Rozes, Cortina d'Ampezzo (Belluno), on dolomite (UTM WGS84: 33T 273856.5158438), 2870 m, 5 August 2020, leg. *J. Nascimbene*, det. *P.L. Nimis, J. Nascimbene* (Herb. Nascimbene JN6884). – Species confirmed for the flora of Veneto.

*Thelidium auruntii* differs from the related *Thelidium pyrenophorum* (Ach.) Körb. in the well-developed brown thallus and the smaller spores. Known form several scattered stations throughout the Alps (Nimis et al. 2018), it is also known from Scandinavia and grows on limestone, dolomite and calciferous schists in upland areas. The material reported here was collected on a humid dolomitic wall along the path to the top of Tofana di Rozes. The last records from Veneto date back to the 19th century (see Nimis 1993).

J. Nascimbene, P.L. Nimis

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## References

Aleffi M, Tacchi R, Poponessi S (2020) New Checklist of the Bryophytes of Italy. Cryptogamie, Bryologie 41: 147–195. https://doi.org/10.5252/cryptogamie-bryologie2020v41a13

Aleffi M, Campisi P, Cogoni A, Cortini Pedrotti C, Flore F, Perego S, Sguazzin F, Tacchi R (2005) Contributo alla conoscenza della flora briologica delle Murge Tarantine (Taranto, Puglia): la Gravina di Petruscio ed il Bosco delle Pianelle. Informatore Botanico Italiano 37: 1137–1144.

Bidaud A, Moënne-Loccoz P, Reumaux P (2001) Atlas des Cortinaires 11: 527–626.

Burgaz AR, Ahti T, Pino-Bodas R (2020) Mediterranean Cladoniaceae. Sociedad Española de Liquenología (SEL), Madrid, 117 pp.

Coppins BJ (2008) *Micarea perparvula* in North America. Opuscula Philolichenum 5: 23–24.

Coppins BJ, Printzen C (1995) *Micarea perparvula* In: Printzen C (Ed.) Die Flechtengattung *Biatora* in Europa. Bibliotheca Lichenologica 60: e204.

Cortini Pedrotti C (2001) Flora dei muschi d'Italia, I parte. Antonio Delfino Editore, Sassari, 832 pp.

Courtecuisse R, Duhem B (1995) Mushrooms and Toadstools of Britain and Europe. HarperCollinsPublishers. Ramsbury, Wiltshire.

Dalla Torre KW, Sarnthein L (1904) Flora der gefürsteten Grafschaft Tirol, des Landes Vorarlberg und des fürstenthumes Liechtenstein. V. Die Moose (Bryophyta) von Tirol, Vorarlberg und Liechtenstein. Wagner, Innsbruck, 671 pp.

Dierßen K (2001) Distribution, ecological amplitude and phytosociological characterization of European bryophytes. Bryophytorum Bibliotheca 56: 1–289.

Døssing L (1992) *Naucoria* (Fr.) Kumm. In: Hansen L, Knudsen H (Eds) Nordic Macromycetes, Vol. 2. Nordsvamp, Copenhagen.

Elborne SA, Læssøe T, Østmoe KH (1992) *Mycena* (Pers.: Fr.) Roussell. In: Hansen L, Knudsen H (Eds) Nordic Macromycetes (Vol. 2). Nordsvamp, Copenhagen.

Esposito A, Filesi L (2007) Caratterizzazione di comunità a *Crucianella maritima* e relazioni con la componente briofitica. Fitosociologia 44(2) suppl.1: 255–261.

Fleischer M (1893) Beitrag zur Laubmoosflora Liguriens. Atti del Congresso Internazionale di Genova 1892: 266–310.

Frey W, Frahm J-P, Fischer E, Lobin W (2006) The Liverworts, Mosses and Ferns of Europe. Harley Books, Colchester, 512 pp.

Herzog Th (1926) Die alpine Bryoflora des Monte Gennargentu auf Sardinien. Botanische Jahrbücher für Systematik 60: 570–579.

Hodgetts N, Calix M, Englefield E, Fettes N, Garcia Criado M, Patin L, Nieto A, Bergamini A, Bisang I, Baisheva E, Campisi P, Cogoni A, Hallingback T, Konstantinova N, Lockhart

N, Sabovljevic M, Schnyder N, Schrock C, Sergio C, Sim Sim M, Vrba J, Ferreira CC, Afonina O, Blockeel T, Blom H, Caspari S, Gabriel R, Garcia C, Garilleti R, Gonzalez Mancebo J, Goldberg I, Hedenas L, Holyoak D, Hugonnot V, Huttunen S, Ignatov M, Ignatova E, Infante M, Juutinen R, Kiebacher T, Kockinger H, Kučera J, Lonnell N, Luth M, Martins A, Maslovsky O, Papp B, Porley R, Rothero G, Soderstrom L, Ştefănuţ S, Syrjanen K, Untereiner A, Vaňa J, Vanderpoorten A, Vellak K, Aleffi M, Bates J, Bell N, Brugues M, Cronberg N, Denyer J, Duckett J, During HJ, Enroth J, Fedosov V, Flatberg K-I, Ganeva A, Gorski P, Gunnarsson U, Hassel K, Hespanhol H, Hill M, Hodd R, Hylander K, Ingerpuu N, Laaka-Lindberg S, Lara F, Mazimpaka V, Mežaka A, Muller F, Orgaz JD, Patino J, Pilkington S, Puche F, Ros RM, Rumsey F, Segarra-Moragues JG, Seneca A, Stebel A, Virtanen R, Weibull H, Wilbraham J, Żarnowiec J (2019) A miniature world in decline: European Red List of Mosses, Liverworts and Hornworts. IUCN, Brussels, 87 pp.

Jacobsson S (1992) *Tubaria* (W.G.Smith) Gill. In: Hansen L, Knudsen H (Eds) Nordic Macromycetes (Vol. 2). Nordsvamp, Copenhagen.

Lantieri A (2011) First record of *Trichoglossum tetrasporum* Sinden & Fitzp. (Helotiales, Geoglossaceae) from Italy. Plant Biosystems 145: 116–119. https://doi.org/10.1080/11263504.2010.543788

Malíček J, Palice Z, Šoun J, Vondrák J, Novotný P (2020) Atlas českých lišejníků. www.dalib.cz [accessed 15.2.2021]

Massalongo A (1852) Ricerche sull'autonomia dei licheni crostosi e materiali pella loro naturale ordinazione. Tip. Frizerio, Verona, 221 pp.

Matheny PB, Vellinga EC, Bougher NL, Ceska O, Moreau P-A (2007) Taxonomy of displaced species of *Tubaria*. Mycologia 99: 569–585. https://doi.org/10.1080/15572536.2007.11832551

Milde J (1864) Ein Sommer in Südtirol. Botanische Skizze. Bot. Zeitung 22 (17 suppl., 19 suppl.): 1–22.

Moreau P-A, Borovička J (2010) Epitypification of *Naucoria bohemica* (Agaricales, Hymenogastraceae). Czech Mycology 62: 33–42. https://doi.org/10.33585/cmy.62104

Munzi S, Ravera S, Caneva G (2007) Epiphytic lichens as indicators of environmental quality in Rome. Environmental Pollution 146: 350–358. https://doi.org/10.1016/j.envpol.2006.03.042

Murru V, Marignani M, Acosta ATR, Cogoni A (2018) Bryophytes in Mediterranean coastal dunes: ecological strategies and distribution along the vegetation zonation. Plant Biosystems 152: 1141–1148. https://doi.org/10.1080/11263504.2017.1418452

Myszczyński K, Bączkiewicz A, Buczkowska K, Ślipiko M, Szczecińska M, Sawicki J (2017) The extraordinary variation of the organellar genomes of the *Aneura pinguis* revealed advanced cryptic speciation of the early land plants. Scientific Reports 7: 1–12. https://doi.org/10.1038/s41598-017-10434-7

Nascimbene J (2013) The epiphytic lichen flora of the forest monitoring plot "Großer Zirmboden", Latemar, South Tyrol. Gredleriana 13: 5–14.

Nascimbene J, Caniglia G (2003) Materiale per una check-list dei licheni del Parco Naturale delle Dolomiti D'Ampezzo (Belluno – NE Italia). Lavori della Società Veneziana di Scienze Naturali 28: 65–69.

Nascimbene J, Martellos S, Nimis PL (2006) Epiphytic lichens of tree-line forests in the Central-Eastern Italian Alps and their importance for conservation. The Lichenologist 38: 373–382. https://doi.org/10.1017/S0024282906006220

Nascimbene J, Nimis PL, Ravera S (2013) Evaluating the conservation status of epiphytic lichens of Italy: a red list. Plant Biosystems 147: 898–904. https://doi.org/10.1080/11263504.2012.748101

Nascimbene J, Thor G, Nimis PL (2012) Habitat-types and lichen conservation in the Alps – Perspectives from a case study in the Stelvio National Park (Italy). Plant Biosystems 146: 428–442. https://doi.org/10.1080/11263504.2011.557099

Nimis PL (1993) The lichens of Italy: an annotated catalogue. Monografie XII. Museo Regionale di Scienze Naturali di Torino, Torino, 897 pp.

Nimis PL (2016) ITALIC - The Information System on Italian Lichens. Version 5.0. University of Trieste, Dept. of Biology. www.italic.units.it [accessed 17.1.2021]

Nimis PL, Nascimbene J (2021) Keys to the lichens of Italy – 51) Endocarpon and Staurothele. http://italic.units.it/flora/index.php?procedure=ext_key_home&key_id=3044 [accessed 3.1.2021]

Nimis PL, Hafellner J, Roux C, Clerc P, Mayrhofer H, Martellos S, Bilovitz PO (2018) The lichens of the Alps – an annotated checklist. MycoKeys 31: 1–634. https://doi.org/10.3897/mycokeys.31.23568

Ohenoja E (2000) *Trichoglossum* Boud. In: Hansen L, Knudsen H (Eds) Nordic Macromycetes (Vol. 1). Nordsvamp, Copenhagen.

Olsen O, Haug S, Nordén B (2019) *Agonimia globulifera* new to mainland Norway. Graphis Scripta 31: 1–4.

Onofri S, Bernicchia A, Filipello Marchisio V, Padovan F, Perini C, Ripa C, Savino E, Venturella G, Vizzini A, Zotti M, Zucconi L (2013) Checklist of the macrobasidiomycetes of Italy. http://dryades.units.it/macrobasidiomiceti/index.php [accessed 1.2.2021]

Paton JA (1999) The Liverwort Flora of the British Isles. Harley Books, Martins, 626 pp.

Pino-Bodas R, Martín MP, Burgaz AR (2012) *Cladonia subturgida* and *C. iberica* (Cladoniaceae) form a single, morphologically and chemically polymorphic species. Mycological Progress 11: 269–278. https://doi.org/10.1007/s11557-011-0746-1

Pino-Bodas R, Araujo E, Gutiérrez-Larruga B, Burgaz AR (2020). *Cladonia subturgida* (Cladoniaceae, Lecanoromycetes), an overlooked, but common species in the Mediterranean region. Symbiosis 82: 9–18. https://doi.org/10.1007/s13199-020-00688-7

Piccone A (1863) Elenco dei Muschi di Liguria. Commentario della Società Crittogamologica Italiana 1: 240–287.

Privitera M, Campisi A, Carratello A, Cogoni A, Flore F, Gueli L, Lo Giudice R, Provenzano F, Petraglia A, Sguazzin F, Zimbone A (2008) La flora briofitica dell'Isola di Lipari (Arcipelago delle Eolie, Sicilia). Informatore Botanico Italiano 40: 3–13.

Puglisi M, Sciandrello S, Musarella C, Spampinato G, Privitera M, Tomaselli V (2019) Bryosociological remarks on garrigue environments in Apulia Region (Southern Italy). Plant Sociology 56: 43–52.

Ravera S, Brezzi G, Massari G (1999) Contributo alla conoscenza dei licheni dell'area romana: la florula epifitica dell'Orto Botanico di Villa Corsini. Biologi Italiani 10: 37–43.

Ros RM, Werner O (2007) The circumscription of the genus *Pottiopsis* (Pottiaceae, Bryophyta) based on morphology and molecular sequence data. Nova Hedwigia 131: 65–79.

Ros RM, Mazimpaka V, Abou-Salama U, Aleffi M, Blockeel T L, Brugués M, Cros RM, Dia MG, Dirkse GM, Draper I, El-Saadawi W, Erdag A, Ganeva A, Gabriel R, Gonzales- Mancebo JM, Granger C, Herrnstadt A, Hugonnot V, Khalil K, Kürschner H, Losada-Lima A, Luís L, Mifsus S, Privitera M, Puglisi M, Sabovlijević, Sèrgio C, Shabbara HM, Sim-Sim M, Sotiaux A, Tacchi R, Vanderpoorten A, Wernner O (2013) Mosses of the Mediterranean, an annotated checklist. Cryptogamie, Bryologie 34: 99–283. https://doi.org/10.7872/cryb.v34.iss2.2013.99

Rossi G, Montagnani C, Gargano D, Peruzzi L, Abeli T, Ravera S, Cogoni A, Fenu G, Magrini S, Gennai M, Foggi B, Wagensommer RP, Venturella G, Blasi C, Raimondo FM, Orsenigo S [Eds] (2013) Lista Rossa della Flora Italiana. 1. Policy Species e altre specie minacciate. Comitato Italiano IUCN e Ministero dell'Ambiente e della Tutela del Territorio e del Mare, 54 pp.

Smith AJE (2004) The moss flora of Britain and Ireland. 2nd edn. Cambridge University Press, Cambridge, 1012 pp. https://doi.org/10.1017/CBO9780511541858

Sotiaux A, Stieperaere H, Sotiaux O, Pohl H (2009) *Fossombronia caespitiformis* De Not. ex Rabenh. subsp. *multispira* (Schiffn.) J.R.Bray et Cargill in Belgium, a remarkable extension of its European range. Cryptogamie, Bryologie 30: 265–269.

Swissbryophytes (2004–2020) Online-Atlas der Schweizer Moose. www.swissbryophytes.ch [accessed 9.12.2020]

Vondrák J, Frolov I, Košnar J, Arup U, Veselská T, Halıcı G, Malíček J, Søchting U (2020) Substrate switches, phenotypic innovations and allopatric speciation formed taxonomic diversity within the lichen genus *Blastenia*. Journal of Systematics and Evolution 58: 295–330. https://doi.org/10.1111/jse.12503

Walther V, Rexer K-H, Kost G (2001) The ontogeny of the fruit bodies of *Mycena stylobates*. Mycological Research 105: 723–733. https://doi.org/10.1017/S0953756201004038

Werner RG (1972) Lichens et champignons de la plainc marocainc. Bulletin de l'Académie Lorraine des Sciences 10: 83–97.